REVISTA CIÊNCIAS DA SAÚDE CEUMA RCS

ISSN 2965-6060

Artigo de Ensaio

Environmental and health challenges in the Amazon through a multidisciplinary approach: highlights from the international workshop on environment, health, and sustainability in the Brazilian Amazon in São Luís, Maranhão

Desafios ambientais e de saúde na Amazônia através de uma abordagem multidisciplinar: destaques do workshop internacional sobre meio ambiente, saúde e sustentabilidade na Amazônia Brasileira em São Luís, Maranhão

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Abstract

The international workshop on environment, health, and sustainability in the Brazilian Amazon was held in the city of São Luís from April 24th to April 27th, 2024. The Brazilian Amazon, a globally crucial ecosystem, faces environmental degradation due to deforestation, illegal activities, and climate change. These factors negatively impact the health and well-being of local and indigenous communities, leading to loss of resources and increased disease risk. Sustainable practices are essential for both the regional and global communities.The meeting promoted by the University CEUMA (Brazil), Bangor University (United Kingdom), and the Claremont Graduate University (USA) congregated scientists, researchers, and stakeholders from private industry, and government bodies. The workshops aimed to address environmental and health challenges in the Amazon through a multidisciplinary approach focusing on the communities' sustainable behavioral change. The "Empowering Sustainable Communities" project, a centerpiece of this collaborative effort, was designed to address these challenges head-on. The team is collaborating on developing the project's proposal for funding by the relevant stakeholders and funding agencies. One concrete outcome of the event is the development of an application to the British Academy "Just Transitions" Programme which has the stated aim: "Ensuring just transitions while tackling climate change and biodiversity loss is key to supporting inclusive economies and societies in the future… and how we can shape a positive future locally, nationally and globally". This will include researchers across several disciplines and from several countries, including Brazil, UK and US. The project will identify specific needs within target populations (impoverished, rural, indigenous communities) and co-design behaviorally informed solutions that address environmental, health, and sustainability concerns. Furthermore, the project aligns with the UN Sustainable Development Goals (poverty, health, clean water, inequalities, sustainable communities, etc.) and the UK government's pillars on climate and forests. Overall, the project will focus on knowledge transfer, capacity building, and potentially influencing Brazilian policies on sustainable practices. We hope this starting project will contribute to establish a platform that can be used for diferrent populations in the Brazilian Amazon as well as to motivate new collaborations with others players globally.

Keywords: Environment; health; UN Sustainable Development Goals; international collaboration; Brazilian Amazon.

Como citar: Fadardi JS; Parkinson J; Miranda RC; Tomaz C. Environmental and health challenges in the Amazon through a multidisciplinary approach: highlights from the international workshop on environment, health, and sustainability in the Brazilian Amazon in São Luís, Maranhão. RCS Revista Ciências da Saúde - CEUMA, 2024; 2(2): https://doi.org/10.61695/rcs.v2i2.36

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E-mail: ctomaz@ceuma.br.
Fonte de financiamento:
Não se aplica
Parecer CEP
Não se aplica
Procedência:
Não encomendado
Avaliação por pares:
Externa
Recebido em: 03/06/2024
Aprovado em: 25/06/2024

Resumo

O workshop internacional sobre meio ambiente, saúde e sustentabilidade na Amazônia Brasileira foi realizado na cidade de São Luís de 24 a 27 de abril de 2024. A Amazônia Brasileira, um ecossistema globalmente crucial, enfrenta degradação ambiental devido ao desmatamento, atividades ilegais, e alterações climáticas. Estes fatores têm um impacto negativo na saúde e no bem-estar das comunidades locais e indígenas, levando à perda de recursos e ao aumento do risco de doenças. Práticas sustentáveis são essenciais para as comunidades regionais e globais. O encontro promovido pela Universidade CEUMA (Brasil), Universidade de Bangor (Reino Unido) e Claremont Graduate University (EUA) reuniu cientistas, pesquisadores e stakeholders da indústria privada, e orgãos governamentais. As oficinas tiveram como objetivo abordar os desafios ambientais e de saúde na Amazônia por meio de uma abordagem multidisciplinar com foco na mudança comportamental sustentável das comunidades. O projecto "Capacitar Comunidades Sustentáveis", uma peça central deste esforço colaborativo, foi concebido para enfrentar estes desafios. A equipe está colaborando no desenvolvimento da proposta do projeto para financiamento pelas partes interessadas e agências financiadoras relevantes. Um resultado concreto do evento é o desenvolvimento de uma candidatura ao Programa "Transições Justas" da Academia Britânica, que tem o objetivo de "Garantir transições justas ao mesmo tempo que se combate as alterações climáticas e a perda de biodiversidade é fundamental para apoiar economias e sociedades inclusivas no futuro… e como podemos moldar um futuro positivo local, nacional e globalmente". Isso incluirá pesquisadores de diversas disciplinas e de vários países, incluindo Brasil, Reino Unido e EUA. O projeto identificará necessidades específicas nas populações-alvo (comunidades empobrecidas, rurais e indígenas) e conceberá em conjunto com essas populações soluções informadas em termos comportamentais que abordem preocupações ambientais, de saúde e de sustentabilidade. Além disso, o projeto está alinhado com os Objetivos de Desenvolvimento Sustentável da ONU (pobreza, saúde, água potável, desigualdades, comunidades sustentáveis, etc.) e com os pilares do governo do Reino Unido sobre clima e florestas. No geral, o projeto se concentrará na transferência de conhecimento, capacitação e influência potencial nas políticas brasileiras sobre práticas sustentáveis. Esperamos que este projeto inicial contribua para estabelecer uma plataforma que possa ser usada por diferentes populações na Amazônia Brasileira, bem como para motivar novas colaborações com outros atores globais.

Palavras-chave: Meio Ambiente; saúde; Objetivos de Desenvolvimento Sustentável da ONU; colaboração internacional; Amazônia Brasileira.

INTRODUÇÃO

The Brazilian Amazon is a vital component of the global environmental system, hosting the largest rainforest on Earth. It plays a crucial role in regulating the world's oxygen and carbon cycles. It is often referred to as the "lungs of the planet" due to its vast capacity to absorb carbon dioxide and produce oxygen.

The Amazon rainforest encompasses a vast array of biodiversity, housing about 10% of the known species on Earth. This biodiversity is not only crucial for ecological balance but also offers potential for botanical and medicinal discoveries. However, this rich environment is under threat from deforestation, illegal logging, mining, and agriculture, which are driven by both local pressures and global economic demands. These activities lead to habitat destruction, and loss of species, and contribute to climate change through the release of significant amounts of stored carbon (Lapola *et al., 2023)*

The health implications of the environmental changes in the Amazon are profound. Indigenous and local communities depend on the forest for their physical, cultural, and spiritual well-being. Deforestation and pollution can lead to a shortage of traditional food and medicinal resources, impacting nutrition and community health. Moreover, changes in the ecosystem can increase the spread of infectious diseases, such as malaria, due to altered habitats that favor disease vectors like mosquitoes (Ellwanger et al. 2020).

Sustainability in the Amazon is crucial for both the local population and the global community. Sustainable practices include supporting eco-friendly businesses, promoting the sustainable harvest of forest products, and implementing policies that encourage the preservation of the rainforest. It also involves empowering indigenous communities to manage their traditional lands and contribute to conservation efforts.

Efforts toward sustainability also include international and non-governmental organizations working in concert with the Brazilian government to enforce laws against illegal activities, investing in research and development of sustainable resources, and promoting education and awareness around the importance of the Amazon.

The future of the Brazilian Amazon is not just a local issue but a global one. Sustainable management of the Amazon is essential to maintain the environmental health of the planet and to ensure the well-being of the people who call the rainforest their home. It requires the cooperation of all stakeholders, from local communities to international policymakers, to strike a balance between the needs of human development and environmental conservation.

International Research Collaboration

In this context, the University CEUMA, situated within the Amazon biome, and recognizing its responsibility and commitment to the whole of Amazonia, seeks to promote a space for international dialogue and cooperation that transcends borders and promotes innovative solutions.

Within such an important context, this event addressed existing challenges and sought to identify opportunities to improve the resilience of local communities, improve sustainable practices, and promote collaborative research between institutions in Brazil, the United Kingdom, and the United States. Furthermore, it aimed to provide a platform for exchanging knowledge and experiences, enabling participants to face emerging challenges with a global perspective. It is widely acknowledged that complex real-world challenges, such as climate change and sustainable development, are best addressed through multidisciplinary teams, bringing together different expertise, world views, and research perspectives. As such, the event explicitly aimed to include a great diversity of expertise from across different academic disciplines such as psychology, anthropology, microbiology, earth systems science, remote sensing, architecture, and others. And also representatives from government and industry.

International Workshop on Environment, Health, and Sustainability in the Brazilian Amazon

The International Workshop on Environment, Health, and Sustainability in the Brazilian Amazon was held at CEUMA University in São Luís, Maranhão, Brazil, from April 24th to 27th, 2024.

The workshop coordinators were Prof. Carlos Tomaz and Dr. Rita de Cássia Mendonça de Miranda (University CEUMA), Prof. Jonh Parkinson (Bangor University, UK), and Prof. Javad Salehi Fadardi (Claremont Graduate University, California, USA).

The workshop aimed to foster international collaboration and dialogue on addressing the challenges facing the Amazon rainforest and its inhabitants.

Objectives

- Promote innovative solutions for the Amazon's environmental and health challenges.
- Improve the resilience of local communities and sustainable practices.
- Facilitate collaborative research between Brazil, the United Kingdom, and the United States institutions.
- Exchange knowledge and experiences to address emerging challenges with a global perspective and a multidisciplinary team.

Workshop Summary

The workshop commenced with a visit to CEUMA University facilities and clinics providing community health services. The official opening ceremony included speeches by key authorities and an opening lecture by Prof. Carlos Tomaz.

Subsequent days featured presentations on research lines by various professors and institutions, followed by workshops led by Prof. Carlos Thomaz, Prof. John Parkinson, and Prof. Dr. Javad Fadardi, focused on preparing collaborative projects. The audience was colleagues from several Brazilian universities and representatives of industries interested in the workshop topics. The workshops aimed to address environmental and health challenges in the Amazon through a multidisciplinary approach focusing on the communities' sustainable behavioral change.

The workshop concluded with field visits to mangrove areas and indigenous communities, followed by a visit to Lençóis Maranhenses National Park.

Some workshop participants during the opening ceremony.

Workshop Outcomes

The workshop successfully fostered international collaboration and dialogue on the pressing issues facing Amazon. It provided a platform for knowledge exchange and the development of collaborative projects to address the region's environmental, health, and sustainability challenges.

The "Empowering Sustainable Communities" project, a centerpiece of this collaborative effort, aims to address these challenges head-on. The team is collaborating on developing the project's proposal for funding by the relevant stakeholders and funding agencies. One concrete outcome of the event is the development of an application to the British Academy “Just Transitions” Programme which has the stated aim: “Ensuring just transitions while tackling climate change and biodiversity loss is key to supporting inclusive economies and societies in the future… and how we can shape a positive future locally, nationally and globally”. This will include researchers across several disciplines and from several countries, including Brazil, UK and US.

Empowering Sustainable Communities

The Brazilian Amazon, a globally crucial ecosystem, faces environmental degradation due to deforestation, illegal activities, and climate change. These factors negatively impact the health and well-being of local and indigenous communities, leading to loss of resources and increased disease risk. Sustainable practices are essential for both the regional and global communities.

Challenges in the Amazon

The Amazon faces a multi-faceted crisis involving environmental (deforestation, climate change), health (disease emergence), and structural (economic growth vs. conservation) challenges. Addressing these requires a multi-pronged approach. Maranhão, a state bordering the Amazon, mirrors these challenges with deforestation, health disparities, poverty, and pollution. Balancing economic development with environmental protection and empowering local communities are key concerns.

Project Focus

This project aims to empower local communities in Maranhão to co-create solutions for their mental and physical health challenges, as well as supporting sustainable development within those communities. The project will be multidisciplinary, utilizing behavior change science and existing research at CEUMA University, and will address health literacy, environmental impacts, and community empowerment.

Research Collaborationand Main Objectives

This international collaboration leverages the strengths of CEUMA, Bangor, and Claremont Universities to address these global challenges. The project will focus on knowledge transfer, capacity building, and potentially influencing Brazilian policies on sustainable practices. The project will identify specific needs within target populations (impoverished, rural, indigenous communities) and co-design behaviorally informed solutions that address environmental, health, and sustainability concerns. Furthermore, the project aligns with the UN Sustainable Development Goals (poverty, health, clean water, inequalities, sustainable communities, etc.) and the UK government's pillars on climate and forests.

Research Lines, Target Populations and Methods

The project will focus on underserved communities in Maranhão, including urban poor, Quilombolas, and indigenous populations. Additionally, the research will encompass health systems, forest preservation, water purification, waste management, health literacy, and urbanization. The focus of interventions within the project will employ a behavior modification approach (COM-B, LEAP) to support transformative change in behaviour at individual and community levels. However, this will be augmented by a consideration of synergies with other research interventions. For example, surveillance for contagious disease in water systems can help promote healthy water-related practices, whilst anthropological expeditions can help understand the unique perspectives and values of target populations to support co-designed interventions that will be understood and accepted within target communities. Biochemistry, remote sensing,

microbiology, and architecture also contribute to the development of multi-level interventions that are more likely to succeed than when using a single approach alone. As such, the project will involve identifying target populations, assessing community needs, analyzing barriers and enablers, co-designing solutions with the community, and embedding a behaviorally informed approach.

Stakeholders

The project involves collaboration between academic institutions, local communities, private industry, and government bodies (FAPEMA). Additionally, The School of Community and Global Health, Claremont Graduate University is particularly poised to play a pivotal role in this ongoing collaboration. The school's expertise in community-based participatory research, health promotion, and environmental health aligns seamlessly with the project's objectives. By actively participating in the co-design of interventions, conducting rigorous research to evaluate their effectiveness, and contributing to developing sustainable solutions, the school can significantly advance the project's mission to empower sustainable communities in the Amazon. Likewise, Bangor University is a Centre of Excellence in the domain of sustainability with research expertise spanning ocean sciences, environmental sciences, and human behavioural sciences. It is fully committed to playing a significant role in the collaborative research programme.

This international partnership exemplifies the power of collaboration in addressing complex global challenges. By bringing together diverse perspectives, expertise, and resources, the "Empowering Sustainable Communities" project has the potential to create a ripple effect of positive change throughout the Amazon region and beyond. By addressing these challenges collaboratively, the project seeks to improve the health and well-being of local communities in Maranhão while promoting sustainable practices and environmental conservation in the Amazon.

Overall, the project will focus on knowledge transfer, capacity building, and potentially influencing Brazilian policies on sustainable practices. We hope this initial project will contribute to establishing a platform that can be used by various populations in the Brazilian Amazon, as well as inspire new collaborations with other stakeholders globally.

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